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ARCHITECTURAL DESIGN
ARMENIAN HIGH SCHOOL, BEIRUT

By
LEON MOMJIAN

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CONTENTS

Page

CHAPTER I

Introduction..... 1

CHAPTER II

General Description..... 3

CHAPTER III

The Hygiene of the School..... 6

CHAPTER IV

Administrative Offices..... 8

CHAPTER V

Corridors, Stairways and Entrances..... 10

CHAPTER VI

The Classroom..... 13

CHAPTER VII

The Library..... 17

CHAPTER VIII

The Cafeteria..... 19

CHAPTER IX

The Auditorium..... 21

CHAPTER X

Laboratories..... 24

CHAPTER XI

The Press..... 30

CHAPTER XII

The Boarding House..... 31

CHAPTER XIII

Physical Education..... 32

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CHAPTER I

Introduction

Each succeeding year has witnessed for centuries the broadening development of public education. Systems of education have been evolved as the result of the careful observation of those engaged in the art of teaching, and these systems have become broadened and extended until the present aspect of modern educational methods is closely allied to the best elements of relationship in the phases of life.

In addition to the development of the school building and its surroundings for educational purposes, there has been developed a further use of the schoolhouse as the community center.

The purpose of this thesis is to design a high school which includes all the parts necessary for educational purposes such as classrooms, administrative offices, laboratories, playgrounds etc. and secondly the part used as a community center, including the auditorium and the library.

This school which is composed of elementary and secondary departments is to serve as an educational and community center for the Armenians of Syria and Lebanon in particular, and for all the Armenians in the Near East in general.

The location for the building has been chosen in a fairly barren area on the plains north of Bain Militaire at Ras-Beirut, within easy reach of the present tramline. The fact that the proposed site has not been built up yet makes it possible to provide a large area around the building for play-

grounds at a fairly low initial cost of land. Moreover this location has the advantages of being open to both the south and the north winds, is fairly high above the sea level and has a magnificent view.

This thesis includes the architectural design of the building and the playgrounds. The separate parts or items will be treated fully in the pages to come.

The author desires to thank Professor K. Veramian for his supervision of the work.

A. U. B. 1948

Leon B. Momjian

CHAPTER II

General Description

Sites, Grounds and Building

The location for this school was chosen on the plains at Ras-Beirut on the north of Bain Militaire. The advantages of the place are:

1. It is a very healthy region, because it is high enough; open from all directions, and away from swamps and boggy lands.
2. Being on a plain surface the additional expense of grading of the playgrounds is avoided.
3. It is away from any industrial center where noise and smoke are detrimental to a school.

Moreover, the building is located in a position so that it is far enough from the street to provide a quiet atmosphere for study at all times. Besides, it is located so as to have plenty of space between the exits and the street to overcome the excitement and haste of students following dismissal from class. The building is placed to receive early morning sunshine and warmth at the entrances, where students have the habit of gathering before classes start.

The play-grounds are located behind the building. This makes the school more easily accessible from the street to the students and to the public. The playgrounds are to be leveled and surfaced with a mixture of sandy loam. Avoiding the formation of gullies after rain, the fields are to be drained by sloping the grounds to the gutters with easy gradients.

All the grounds are to be fenced from the rear, leaving the front of the site and approaches to the building unfenced, as

such treatment gives a more inviting appearance to the public and to the students.

Modern architecture is practiced in planning the building. Attempts are made to achieve logical function, sound construction and beautiful composition. In working out the facades, some architectural requirements, such as contrast, balance, rhythm and unity were considered. The tower on the main entrance gives a contrast of mass, direction and line. The treatment between the windows displays a contrast of tone. The entrance of the auditorium presents a contrast of shape. Contrast of mass is clearly seen by the differing heights of the library, the auditorium and the cafeteria. Unsymmetrical balance is obvious from the large and heavy mass near the center of the group, while the lighter and lower elements are on the sides. A vertical unit is introduced in order to create the desired accent. Rhythm is exercised by repetition of the size and spacing of the windows.

Planting of trees and flowers will add to the aesthetic appearance of the building, as Lord Bacon said, "A man shall ever see that when ages grow to civility and elegance, men come to build sooner than to garden finely, as if gardening were the greatest perfection".

The building is to be a framed, reinforced concrete structure. Exterior walls are to be 35cm. thick. Inside partitions will vary in thickness from 15-20cm. The different parts of the building are: the basement which will consist of the gymnasium, the press and the general storage space; in the first floor, the classrooms, 19 in number, toilet rooms, administrative offices, the library, the museum and the bookstore. On the left end of the

first floor there is the auditorium and the cafeteria. One half of the second floor is used as a boarding section for girls, while the other half has the laboratories and the music room. All the third floor is the boarding section for boys.

Area covered by the building alone is about 3400 square meters. An area around 20400 square meters is required for the playgrounds.

CHAPTER III

The Hygiene of the School

This subject is obviously very important, for it deals with the health of the occupants of schoolrooms and building. Scientific knowledge is available and must be applied to modern school-houses. The important hygienic factors necessary in the modern scientifically constructed school buildings are:

Ventilation:- It is defined as the changing or removal of confined air, charged with chemical and physical impurities, by normal outside air. The requirements of ventilation are; the maintenance of a proper temperature of 65-68 degrees Fahrenheit, 50-65% of humidity, gentle motion of air, freedom from dust, odors, bacteria and gases.

In planning the building many windows are provided for a satisfactory method of ventilation. The building is located to face the south-west winds, where cross ventilation affords motion and interchange of pure air. As for artificial heating and ventilating devices (if installed) would need the accepted universal requirements of an adult, of not less than 30 cubic feet per minute. The particulars of those methods are not discussed here.

Heating:- This is a question which goes hand in hand with ventilation. The only consideration of these two factors of hygiene is made in placing the windows and orienting the building in a way that, more or less, natural ventilation and heating by the sun are furnished.

Lighting:- Sunshine destroys bacteria. It adds cheerfulness and comfort to the room and automatically encourages cleanliness. Since it is true that natural light is not always uniform, on account of the changing seasons of the year, the window space is made

to have one sixth of the floor area. The building is oriented in the position as shown because east, south-east, west and northern exposures afford the best lighting effects. The windows of the classrooms are on one side and the seating is arranged in a way that the rays of light pass over the left shoulder of the student, thus overcoming cross shadows and consequent eye strain.

Plumbing:- In planning the building, the school toilet rooms for both sexes are located so as to be accessible to the playgrounds. This is done in order to save duplication in plumbing and avoid additional expenses needed for erecting a separate building for these purposes.

Toilets are distributed in a way that they are more on the first floor than on the other floors separately. This is because the toilets on the first floor are likely to be used more ^{because they} ~~on acc-~~ ^{are} ~~ount of being~~ more accessible to the playgrounds and because of the tendency of the students to go downstairs during recess periods. Besides, every floor is accommodated with toilets for both sexes. The number of toilets required by girls is in the ratio of one for every 20, while for boys it is one for every 25. All toilet rooms are placed in positions to have natural ventilation, by allowing ^{as} large window space as possible.

Drinking fountains are to be placed in the playgrounds in the ratio of one for every 75 students. In addition to those on the playgrounds there are two separate fountains of single jets placed in the corridors of each floor of the building.

CHAPTER IV

Administrative Offices

The Principal's Office:- This is located on the first floor on the front part of the building facing the street. It has an area of 11.56 square meters, which is enough to accommodate several persons at a time. It is very well lighted and ventilated. The entrance is from the main corridor. There is a toilet room opening off the small corridor joining the main corridor and the principal's office. To avoid the difficulty for parents and visitors to reach the principal's office from the main corridor, which is nearly always crowded when classes are passing, a separate entrance through the secretary's office is provided.

The Secretary's office:- This office is located adjacent to the principal's office. It has an entrance on the small corridor which leads to the principal's office. Its area is 18.00 square meters. A part of the room is made into a space for keeping school records in filing cases. The toilet room on the small corridor is for the use of the principal and the secretary.

Adjacent to the secretary's office there is the waiting room. A door opens to this room from the secretary's office to make the secretary keep in contact with students and visitors. This waiting room is desirably connected to the secretary's office because many of the questions that come to the principal's office can be answered by the secretary without interrupting the administrative work of the principal.

The Doctor's Office:- This has an area of 11.56 square meters and has a door on the main corridor, but is separated from it by a small corridor on which the private toilet room

of the doctor opens. This room is located in the middle of the building so as to be accessible from all the sides.

The Teacher's Room:- The teacher's room is provided to act as a gathering place and a rest room for the teachers when they are not on duty. The room has an area of 31.68 square meters and opens on the main corridor. This room is supposed to be fitted with suitable chairs, couches, pillows and other comforts. Adjacent to the room and opening on a small corridor there is a toilet room.

The Janitor's Room:- As it is the usual practice the janitor's room is located in the basement. This location will provide an easy access to all parts of the building.

CHAPTER V

Corridors, Stairways and Entrances

The efficiency of the school plan depends largely upon the orderly arrangement of the corridors, stairways and entrances. These give an impression of balance, and have a psychological effect in the sense of safety conveyed and the directness of access to the different rooms and floors.

Corridors

Width:- The width of the main corridor is 3.00 m. and that of the right wing 2.80 m. These are chosen to provide adequate channels of circulation and a minimum time to empty the school during fires.

Walls:- The lower 1.50 m. of the walls are subjected to hard usage, therefore they are to be plastered with a mortar of rich mixture. Wood may be used but being expensive, is discarded in favor of plastering.

Painting:- The walls and the ceiling are to be treated in light colors so as to reflect the greatest possible amount of light. A tone of refinement will prevail in the corridors if judgement is exercised in selecting the decorations such as pictures and statues.

The Floor:- Many kinds of materials render their use as a corridor flooring material, but because they are expensive, ordinary tiling is to be used. This kind of flooring is cheap, more or less durable, washable and possesses pleasing and lasting colors.

Bulletin Boards:- These boards are to be placed on the left hand wall of the main lobby. This is a splendid location because it is near the main entrance, at the center of the building and near the administrative offices. These bulletin boards are to be made of

simple wood.

Doors:- All the doors on the corridors are to be of the panel type with obscure glass panes. This will provide the corridors with natural lighting.

Stairways

All the staircase rooms have no doors from inside. This is so to make them safe and to provide an easy escape in case of fire.

Width:- The main stairway facing the main entrance is arranged to have a width of 2.00m. at the middle part and of 1.50 m. on the sides. These will provide a space enough for three students to walk abreast on the middle section and two students on the side sections. The staircase rooms at the right wing and at the left end have a total width of 3.40 m.

Landings:- The width of the landings is made the same as the width of the stairs and (they are at one half the storey high) except the one of the main stairway which is a little lower to furnish a suitable entrance to the library.

Balustrades and Handrails:- The outside balustrades are to be of closed construction. This will give a protection to the girls from those at lower levels. The height of the balustrades is to be 0.60 m. At the top of the balustrades there are to be the pipe handrails at a height of 25-30 cm.

Risers and Treads:- The height of the riser is made 17 cm. and the width of the tread 28 cm. This width is measured from nosing to nosing or from riser to riser. Since the building is to be of reinforced concrete framed structure, the material for covering the stairs is to be mosaic reinforced tiles; one piece as a tread and another as a riser. The spaces under the stairs

28+3
= 31 cm

are to be used as janitor's closets. They are to be sealed to have a better appearance.

Entrances and Exits

The entrance doors and exits are made in a way that they always open outwards. The main entrance is composed of three large doors opening outwards. They are made of iron and obscure glass. The other four doors, two on each wing are to be made of wood.

CHAPTER VI

The Classroom

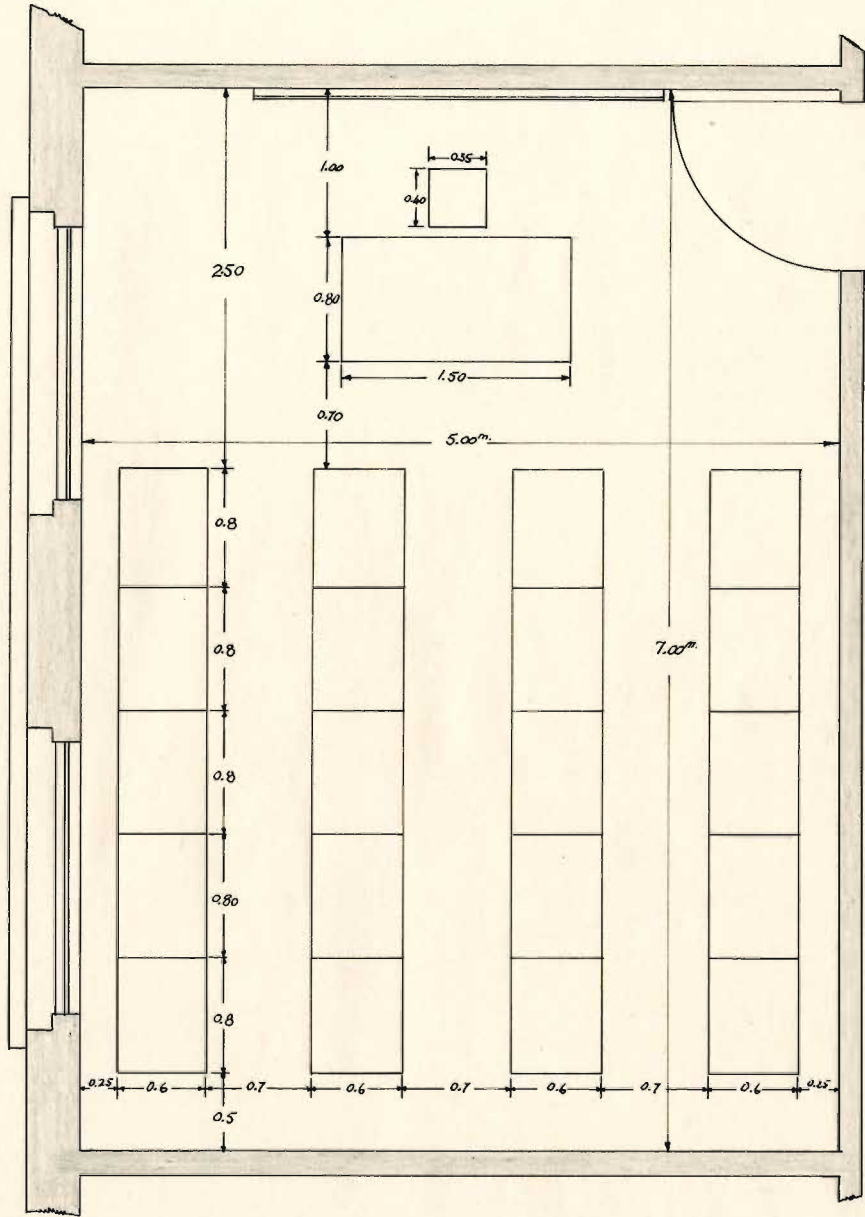
The classroom is the fundamental unit of the school organization. And it is because of this vital fact that definite discussion is presented here. Average number of the students in each class is 20.

Size of Elementary Classrooms:-

The size chosen is 5.00x7.00 m. Allowing for every student a space of 1.75 square meters including aisles, seats and front space. The seats are placed in the short side of the room in four rows of five seats each. This is done because the narrower room requires smaller structural spans and consequently is of less expensive construction. The ceiling height may also be less for the narrower rooms.

Width of the Aisles:- From the figure it is shown that the side aisles are 25cm. wide, because they are more or less never used. The width of the inner aisles is 70cm. Allowing enough space as is necessary for free circulation. The space occupied by each desk is 80cm.x60cm. This will provide an area large enough to be comfortable. The distance from the first row to the front wall is 2.50 m. The teacher's table rests on a platform 25 cm. high and is at a distance of 70 cm. from the first desk and 1.00 m. from the wall. These arrangements are chosen on the assumption that there is only one blackboard at the front wall.

Size of High School Classrooms:- The principles observed in planning the high school classrooms are practically the same as those for the elementary classrooms. The number of students



Plan of a Classroom

Scale 1:50

in each class is 20. The seating arrangement is the same as for the elementary classrooms for the sake of simplicity and flexibility.

Other Considerations:- The height of the ceiling from the floor is determined by the amount of direct light falling upon the row of desks most removed from the windows. The rule considered here is that the classroom is made not wider than twice the height of the window head from the floor.

The classes are to be furnished by artificial lighting which are supposed to be used under special conditions.

The glass area, which in our case depends upon the locality and the orientation of the rooms, is made 20% of the floor area, because the location is such that the sunlight is quite intense and the building is far enough from other structures which obstruct the sunlight. The height of the windows from the floor is 1.00 m. This will prevent glaring light from the ground and surrounding objects which shine directly into the eyes of the students sitting near the windows; an extremely harmful and annoying experience. On the other hand this height will enable the student to look out for a momentary restful change. Venetian blinds are to be used, because they are appreciated in this country. During the hot days the windows are opened wide. The blinds shut out or deflect the sun's rays to the white ceiling which gives a diffused light to the room.

Slate is the best material for blackboards, but being rare and expensive, simple plastering and painting is to be used. The height of the chalk rails in the elementary classroom is 20 cm. above the floor of the room and the width of the blackboard above the chalk rails is 1.10 m. For the secondary classrooms they are 90 cm. and 1.20 m. respectively. These heights are

chosen to enable the students to write on all the blackboard area and at the same time see clearly the teacher's writing from all parts of the room.

Wood is to be used as flooring material for the classrooms, since it prevents dampness on the first floor and noises from the above floors. Besides, they have a pleasant appearance, are low in cost and easy for repairing and maintenance.

The doors have a clear width of 1.20 m. and a height of 2.20 m. The panel type of doors are to be used with reasonably small panels of obscure glass panes. This is chosen because considerable light may be transmitted into the corridors. The doors are to be fitted with locks which never permit the door to be locked on those within the room.

The plastering is to be made of cement mortar with lime, as this method is the local practice and is the cheapest for providing good acoustics. All finish plaster work is to be troweled to a smooth finish avoiding the sand finish which is a catchall for the fine particles of dust. Moreover smooth finish is desirable for painting. White color is to be used on the ceiling and a part of the walls, as it reflects as much diffused light as possible. Below, light gray or any of the light, soft, pleasing colors which will harmonize with the wooden furniture of the rooms should be used. The choice of the color depends also on the position of the room. The quality of the paint should be such that it is washable with soap and water for cleaning purposes.

CHAPTER VII

The Library

The prime considerations dealt with in planning the library are: exposure, accessibility, relation to correlated school suites or offices and possibility of expansion.

The location of the library is such that it forms a wing of the whole building. Being exposed from the three sides it has the best of natural light. The library is more or less on the second floor level, away from noise and confusion of the other parts of the building. It is at the center of the building and near the main entrance.

The area of the reading room is 238.00 square meters. Allowing an area of 1.50 square meters for each reader the room will be enough to provide a seating capacity for about 160 students at one time.

The main entrance opens into a hall where adequate space is furnished for the catalogues and the charging desk. One door joins this hall to the reading room as this will provide an ample means of supervision to the librarian.

The stack room has an area of 39.20 square meters which is enough to store about 4000 books.

On the other side of the hall there are the librarian's office and his or her work room. This position will offer an easy access to all the parts of the library. A door opens from the librarian's office to the reading room for supervision.

Interior Construction:- The stacks are to be double-faced. The aisles between the stacks are 70 cm. wide.

The doors are so placed as to provide a means of supervision over entering and leaving students. All doors are to be equipped with door checks to prevent them from closing noisily.

The flooring is to be of wood as this will cause very little noise from use.

The window area of the reading room is nearly 20% of the floor area. Being placed in a way to have a sunny exposure most of the day it proves to be cheerful and inviting. All artificial lighting is to be from above. The semi-indirect system is to be used.

The ceiling and the walls are to be finished in light tones in order to reflect the greatest amount of light. Tones off the white are to be used for the ceiling and gray for the walls. The reading room is to be decorated with paintings and decorative designs, as this will reflect the quiet and refined thought of the school.

The tables are to be arranged in rows with the ends parallel to the windows in order that the greatest number may have the best lighting conditions. The tables are 1.00 x 2.00 m. and 75 cm. high. Each will accommodate six students, two at each side and one at each end.

The reading room will have a reserve shelf 1.50 m. wide, occupying one corner of the room.

To eliminate noise, rubber caps are to be fixed on each foot of the chairs. The height of the chairs will be 40 cm.

Besides the above mentioned requirements, the library should be equipped with catalogue cases, periodical racks, bulletin boards etc.....

CHAPTER VIII

The Cafeteria

The cafeteria is not a place where cold food brought from home may be eaten, but it is a place where the students (lodgers and boarders) can obtain warm food, served in an appetizing manner and at a reasonable price.

The cafeteria is located at the back of the auditorium, far enough from the other parts of the building for odor considerations. The different parts are: two dining rooms (one for the students and another for the teachers), a kitchen and its store room.

The dining room for the students has an area of 160.00 square meters. This area is large enough to accommodate 128 students at a time.

The window area is made 15% of the floor area. All the walls and ceiling are to be finished with light gray as this will reflect the greatest amount of light. Artificial lighting is to be made from above. The floor is to be tiled, because it is washable and has, a more or less, permanent color.

Access to the serving counters is made by means of an aisle, leading directly from the entrance to the checker's station. The width of this aisle is 80 cm. and is railed off from the dining room proper. The counter is 70 cm. wide and of different sections such as tray, bread, salad, food etc.

Two wash basins and a drinking fountain are placed near the entrance for washing and drinking water.

The tables are 2.50 x 1.00 m. enough for eight, three on the sides and one on each end.

The teacher's dining room is adjacent to the kitchen and join-

ed to it by a short corridor. Its area is 60.00 square meters, which is sufficient for 32 persons eating at a time. The tables are to be made for four persons.

The kitchen has an area of 37.00 square meters. An outside door to the service section is provided to avoid bringing in raw materials through the main building. The position of the kitchen provides natural ventilation. It is separate from the other parts and is to be equipped with a baking oven, cook's table, cook's sink and cutting block.

The store room is large enough to meet the requirements of storing raw materials and it is near the kitchen for proper use. Besides, the service section is provided with a toilet room for the use of the cook and his assistants.

CHAPTER IX

The Auditorium

The auditorium is that part of the school where students are stimulated to lives of useful endeavor. It is the place which exerts a strong influence on the student. Nor is its use confined to the school alone. It is used as a comfortable gathering place for the community.

The auditorium is composed of: the stage, two dressing rooms, the seating hall, the balcony the projection booth, toilet rooms for both sexes, and lobbies.

Seating Capacity:- The area of the seating space is 273.00 square meters with an allowance of 0.65 square meters per seat. The total number of seats on the main floor is 420. These dimensions also provide for the aisles. The balcony has an area of 117.00 square meters and will provide a seating space for 180 persons. The total number of seats both on the main floor and the balcony is 600.

Height:- The height of the auditorium is 2.75 m. This height has been governed by architectural treatment of the room, but more so by the correct volume necessary to provide for adequate ventilation.

Floor:- The floor is to remain level, because provision is thus made for dancing and social gatherings. Moreover the level floor is justified because the number of seats on the main floor is less than 500. A clear view of the stage by every occupant can be obtained by adequate arrangement of the seats.

Dimensions:- The seats are to be arranged in three sections. The side sections are 3.0 m. wide while the middle one 4.0m.

wide. The aisles are made on the sides to prevent a large gap in front of the stage.

Location:- The location is such that it forms a separate part of the main building, but attached to it by an entrance at the end of the main corridor of the school house. The hall is placed on axis with the main entrance for convenience to the public.

The Stage:- The area of the stage is 28.00 square meters, its height above the floor of the main hall is 1.10 m. Two dressing rooms, one on each side of the stage are provided for activity purposes of the students and the public. At the back wall of the stage a moving picture screen is to be fixed at an angle nearly perpendicular to the lantern's rays.

Acoustics:- The interior of the auditorium is treated in a way to obtain the proper acoustical quality for the hall. The side walls are divided into large bay-like panels with a maximum window area, as the open window is the best absorber. Curtains may also help in preventing the secondary waves from returning with force to the listener.

The Projection Booth:- This is to be placed on top of the second floor lobby. Its area is to be 12.00 square meters. It is to be solidly built to prevent the dancing of the picture due to machine vibrations. The opening of the rays is to be made in a way that the vertical and horizontal axes of the picture rays strike the center of the screen.

Lighting and Illumination:- The auditorium is provided with good natural lighting because it is open from all sides. Two rows of windows are placed on the side walls. These windows are to have long curtains, which have proved to be advantageous for acoustics as well as for decorative purposes. Electric lighting

is to be semi-indirect, of ample wattage, as this is more cheerful and non harmful.

Aisles:- The width of the aisles is 1.80 m. near the entrance and decrease gradually to 1.50 m. near the stage. The distance back to back of the seats is to be 90 cm.

Exits:- The auditorium has four exits from the main hall and two exits from the balcony. All the doors are 1.70 m. wide and open outwards. The outside entrances, three in number, to the auditorium are to be of iron and obscure glass. These gates are also designed to open outward for safety during fires.

Painting and Decorations:- Light, cheerful colors such as soft cream is to be used on the walls and ceiling of the hall. The spaces between the window bays are to be decorated with mural paintings and pictures.

CHAPTER X

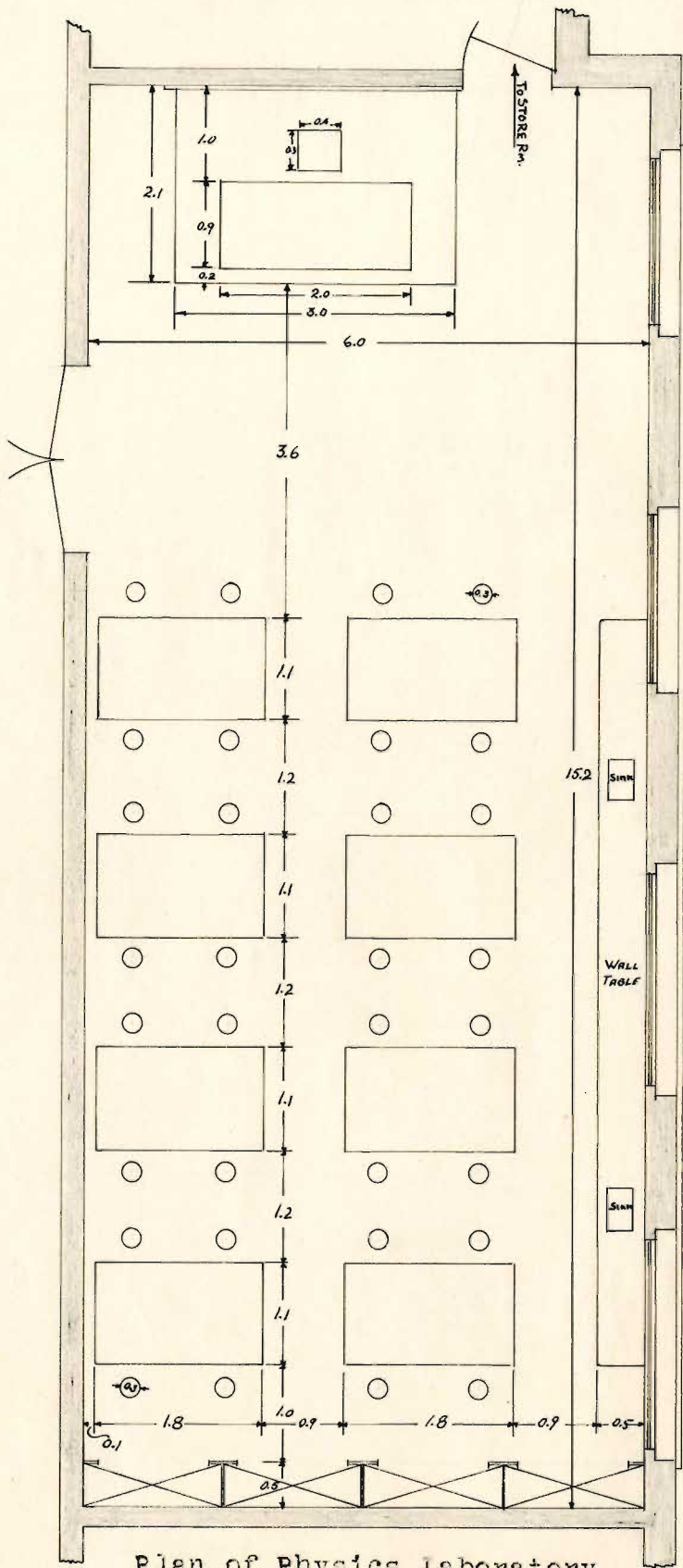
Laboratories

One half of the second floor area is occupied by the laboratories, the lecture room, and the science library.

The lecture room has an area of 39.50 square meters. The seating arrangement is to be done by the raised bank of tablet chairs which gives the students a distinct advantage in seeing the demonstrations, and it gives the teacher the same advantage in observing the students. The depth for each row of chairs will be 70 cm. and the rise for each 20 cm. The windows are on one side only and on the left hand side of the students. An area of 0.50 square meters is to be reserved at the back of the room for the lantern. The lantern screen which is to be on a spring-roller is to be mounted at the center of the front of the room above the blackboard.

The science library is located to face the main staircase on the main facade. This library is to hold a collection of good reference books near at hand. It is large enough and well lighted. The room is divided into two parts by three semicircular arches.

The Physics Laboratory:- The area of the physics laboratory is 91.20 square meters. A row of windows on one of the side walls provide an adequate means of lighting. A wall table is to be built under the windows and of the same height as the other tables. Near the back wall wooden cupboards are to be placed for the delicate apparatus. Stools are to be 70 cm. high and rubber tipped because the floor is to be of wood. The tables are to be of the simple type as shown on the sketch. The height should be around 100 cm. to allow the stools to go underneath, thus allowing the



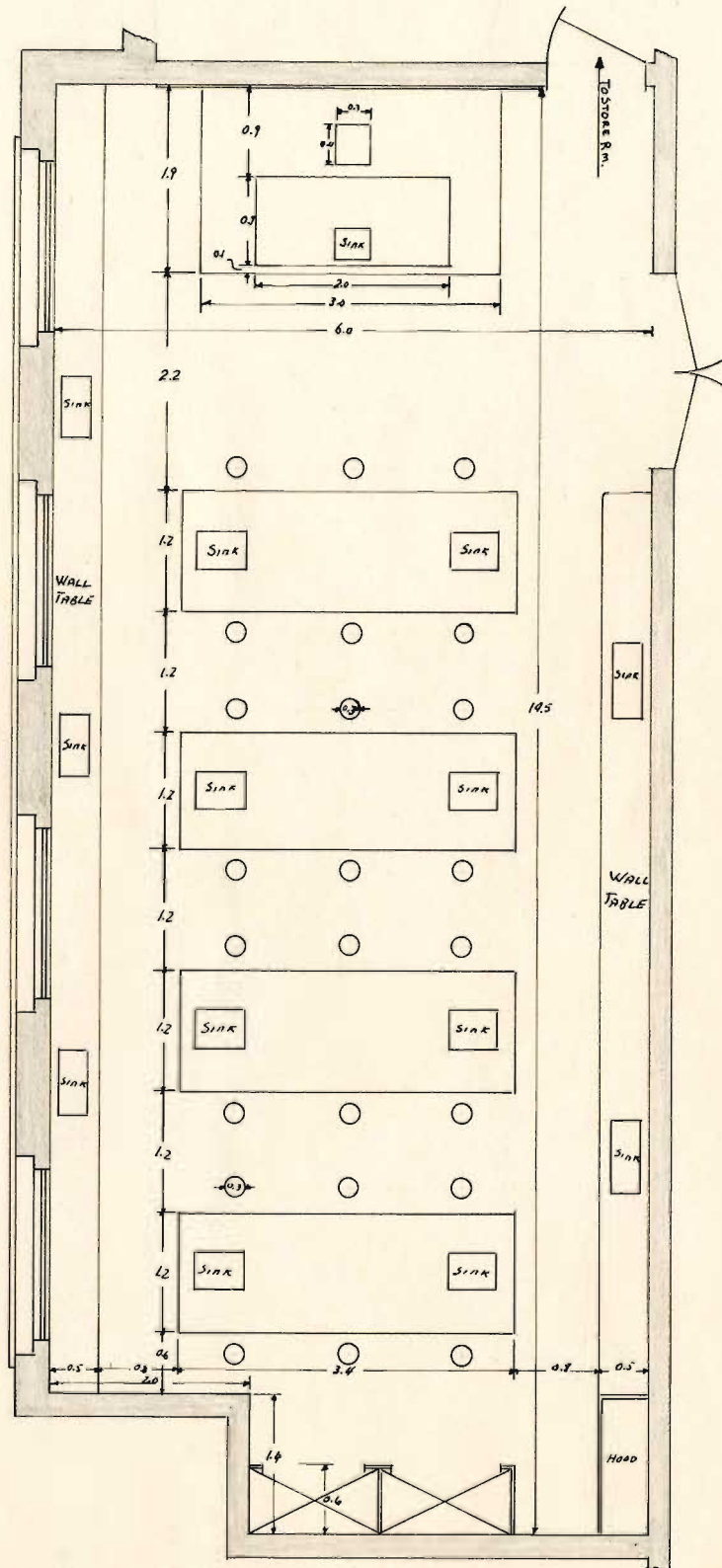
Plan of Physics Laboratory

Scale 1:75

passageways to be cleared in an instant. The gas pipes and the electric conduits are to be laid under the floor. The space in front of the room is provided for seating during temporary explanation by the teacher. A door joins the laboratory through a corridor to both the store room and the dark room. The store room is to be entered also from the lecture room. It is the place for classifying apparatus so that it may be kept in order and found at short notice when required. The dark room is cut from the outside light by the small corridor. This makes the room naturally dark during all hours of the day.

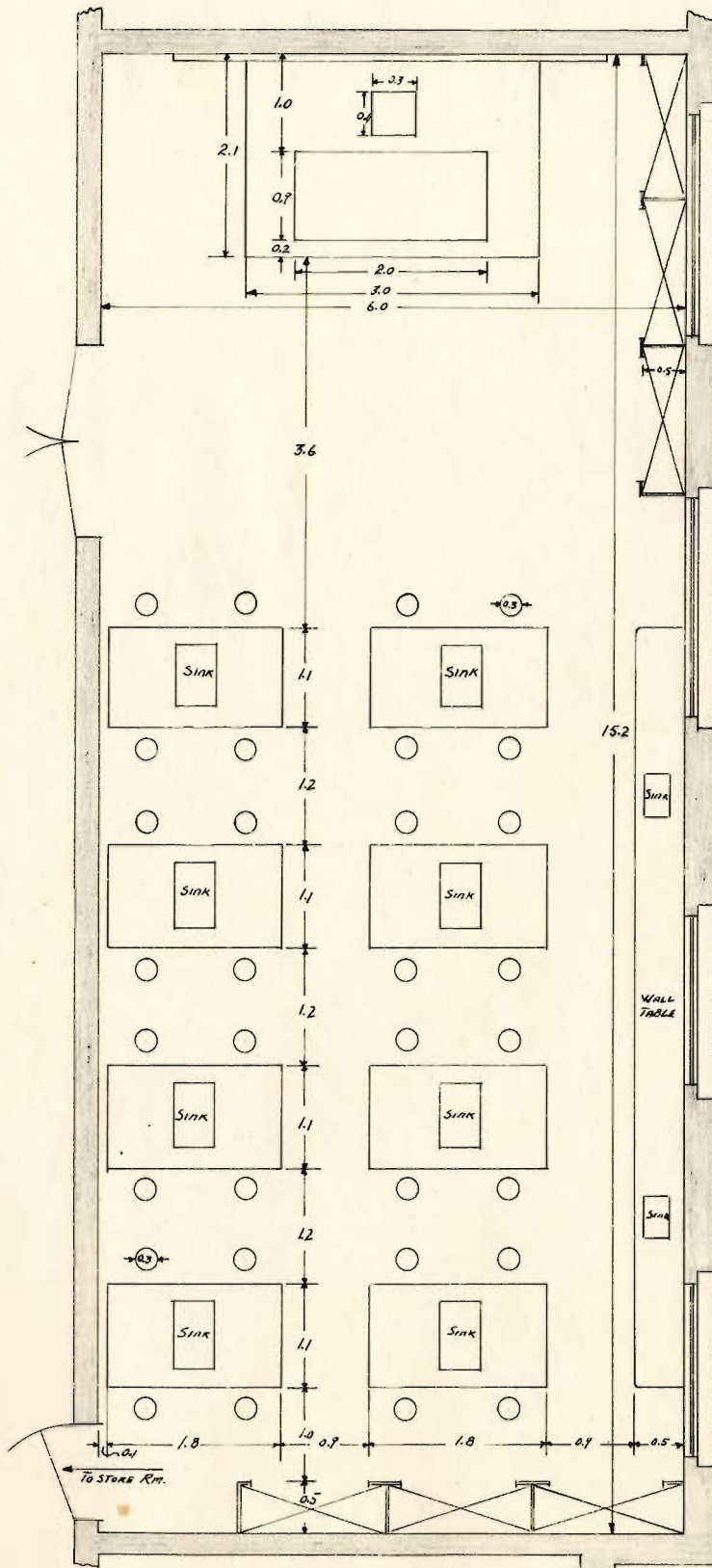
The Chemistry Laboratory:- The chemistry laboratory is located on the front façade. The area is 87.00 square meters. The sketch shows the arrangement of the tables and the other equipment of the laboratory. On the far corner of the room a hood is provided for certain experiments which result in disagreeable odors. Narrow cupboards are to be placed near the back wall to hold one row of bottles of reagents. The flooring is to be of wood to hide all the pipes and wires. The teacher's table rests on a platform 25 cm. high. The tables are 3.0 x 1.2 m. These are enough for six students to work without interfering with each other's work. A door joins the laboratory to its store room where adequate space is provided for storing of apparatus and reagents in large quantities.

The Biology Laboratory:- The area of the laboratory is 91.20 square meters. The room is facing south, therefore it is against the direction of the prevailing winds. The items mentioned in relation to the physics and chemistry laboratories are to apply to the biology laboratory. Moreover, the adjoining sketch gives



Plan of Chemistry Laboratory

Scale 1:75



Plan of Biology Laboratory

Scale 1:75

all the arrangements and the dimensions of the equipment of the room . An outdoor biology laboratory can be made, if desired, outside the building between the playgrounds and the back of the school.

CHAPTER XI

The Press

The press occupies one half of the front part of the basement. It is intended to be a small press, but including the necessary parts for printing pamphletes, the school bulletin and some-times books on a small scale.

The different parts of the press are: a hall for printing machines, a type-setting room, two stores; one for finished products and the other for raw materials, an office and a toilet room.

The press has an entrance from the back of the building besides the one from the main staircase. This will save the disturbance caused in bringing in the raw materials. The clear height of the ceiling is 3.20 m. Light is furnished by long and narrow windows on the main and back facades. The floor is to be of wood to prevent dampness. Electric lighting of ample wattage is to be provided for use in case of need. All the dimensions are shown on the plan.

CHAPTER XII

The Boarding House

Boarding House for Girls:- This occupies one half of the second floor. It is provided with a private staircase. Two types of rooms are planned: rooms for two students and dormitories for four students. The total number of students is 50. The toilet rooms are placed on top of the first floor toilet rooms for easy plumbing installations. The ratio of the toilet seats to the number of students is one for every 6 students. The showers are one for every 6 students. One of the corner rooms, facing the sea is made into a sitting room connected by a kitchen. Every student is provided with a cupboard of her own. The woman teacher may occupy one of the small rooms.

Boarding House for Boys:- All the third floor area is made into the boarding house for the boys. Two separate staircase rooms are provided one at the middle and the other on the side. The small rooms are for two students and the large ones for four students. Every boy has his private cupboard. The sitting room in front of the main staircase room is to serve as a gathering place for the students. On both sides of the main staircase room, two rooms for teachers are located for better inspection. The total number of students accommodated is 100. The toilet seats are in the ratio of one for 9 students and the showers are one for every 7 students.

Both boarding houses are planned in a way that they receive sun rays during one part of the day. The floors are to be tiled. The walls are to be white-washed. Electric lighting is to be from above. One bed, a table and a chair are needed for each student.

CHAPTER XIII

Physical Education

The need of extensive physical activity is being felt by everybody and the feeling is growing that these activities must be guided through the school years of a young man and a young woman in order that proper health and habits may be established.

The physical education plant in our school includes the indoor gymnasium and the playing fields. These are enough to put into effect a thorough physical education program.

The Indoor Gymnasium:- The gymnasium is located in the basement and is composed of three units: the office or administrative unit and the store room; the locker and shower rooms for both sexes and the exercise floor.

Each of the office and the store room has an area of 14.80 square meters. The office of the instructor opens on the exercise floor for better supervision. It is to be equipped with file cases for statistics and a complete first aid outfit. The store room is as large as the office for adequate storing purposes.

The locker and shower rooms for both sexes are placed on the sides of the corridor. One door opens on each locker room from the corridor, and another door joins the locker room to the shower room. The lockers are to be arranged in double tiers. The showers are to be of the simplest type; overhead and 2.40 m. high.

The area of the exercise floor is 238.00 square meters. Its height is 5.0 m. Proper considerations are to be made during construction to insert hooks to the beams for gymnastic apparatus. The windows are 2.40 m. from the floor. This height is selected from the standpoint of the use of the side walls for the attachment of

various pieces of apparatus and various games. A portion of one of the side walls is to be equipped with a large plate glass mirror in order that students may observe postural defects. The windows are to be opened out as this permits the opening up of the whole side of the room. Flooring is to be of wood, because it is noiseless and less dangerous in case of falling.

The Outdoor Play Grounds:- The play grounds are located at the back of the school building, fenced from the other three sides. A 400m. track encircles the football field, the basket ball, volley-ball, and tennis courts. Latest standard dimensions of the courts are indicated on the plan. Provision is made for track and field games. High jump, pole vault, and broad jump pits are located in front of the stand on the other side of the track. Discus and shot put circles are placed on both sides of the tennis court. Javeline line is to be marked on the football field. Moreover, a parallel bar, a horizontal bar and gymnastic apparatus are to be placed near the basketball and the tennis courts.

The stand is to be of reinforced concrete construction with cantilever roofing. One entrance is provided at the center on top of which a high tower is to be mounted for a flag. Seating arrangement is done on step-like floor. The height of each step is to be 25cm. At the lower middle portion a semi-circular seating arrangement is provided for guests and officials. The under part of the stand will contain showers and toilets for players, toilets for the public and general storage space.

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THE END

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